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7th International Conference on

Smart Agriculture and Water Resource Management (SAWRM-2024)

Apr 06-07, 2024

Souvenir

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About Conference

7th International Conference on Smart Agriculture and Water Resource Management (SAWRM-2024), April 06-07, 2024

In the aftermath of the COVID-19 pandemic, as we transition into a hybrid mode, many vital activities that were once halted are now resuming. Yet, amidst this transition, there's a silver lining — we've been afforded more time to enrich our knowledge and deepen our insights.

With this aim, to keep contributing to learning and motivation International research and development Center for publication is going to organize a two-day International Conference with the title "**7th International Conference on Smart Agriculture and Water Resource Management (SAWRM-2024), April 06-07, 2024"** through Hybrid mode.

We're optimistic that transitioning to a hybrid format for this conference post-COVID-19 will represent a commendable stride in fostering research endeavors and knowledge exchange among researchers, developers, students, academics, and practitioners worldwide. By offering both online and in-person attendance options, we aim to accommodate diverse preferences while upholding social distancing measures to halt the spread of COVID-19. This conference endeavors to showcase the latest research endeavors in the realms of social science and educational development on a global scale.

Prospective authors from academia as well as industry are invited to submit their abstracts that illustrate original/unpublished works and industrial applications describing advances and significant innovations in the field.

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Message

I am extremely pleased to share that International Research and Development Center for Publication (IRDCP) is organizing a two days **7th International Conference on Smart Agriculture and Water Resource Management (SAWRM-2024), April 06-07, 2024.** I am sure the state of art lectures from the invited experts and the research findings of researchers, academicians, utility engineers will enrich the knowledge of all the participants. It will provide an excellent opportunity for students to learn new ideas.

I offer my best wishes to the whole team of the organizing committee, the participants, and volunteers for the grand success of the conference.

Dr. Elsey N
Convenor SAWRM-2024

Message

I am happy to know that International Research and Development Center for Publication (IRDCP) is organizing a two days **7th International Conference on Smart Agriculture and Water Resource Management (SAWRM-2024), April 06-07, 2024.** I am sure that, this conference would provide an ideal platform for the academicians, scholars and experts to present and exchange their research findings and Ideas.

I wish the conference a great success.

Prof. (Dr.) Amit Mukherjee
President (Chancellor)
Agricultutre University, Kolkata

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Abstracts of SAWRM-2024

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Sustainable management of yellow mite (*Polyphagotarsonemus latus* Banks) on Chilli

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Abstract

Chilli (*Capsicum annum* L.) is an important spice and vegetable crop, commercially grown in India throughout the year. Chilli plant is susceptible to various insect and mite pests of which yellow mite, *Polyphagotarsonemus latus (*Banks), (Tersonemidae: Acarina) is most predominant. The mites attack young apical leaves, flower buds and cause curling and crumpling of young developing plant parts resulting shedding of flower buds, flowers and developing fruits. The incidence of this mite population always remained higher on upper canopy of the plant followed by middle canopy and lower canopy. Mites were most densely populated in the young and new leaves of chilli plant on upper canopy. So sprays should be carefully taken on the upper canopy. Among the seven treatments evaluated microbial toxin- avermectin resulted in the best suppression of mite population (86.32% suppression), closely followed by chemical insecticide, fenazaquin (73.07%) and mixed formulation of botanical pesticide, azadirachtin with botanical extract, Spilenthes (70.99%). The botanicals, *Spilanthes paniculata* floral parts and garlic were extracted in methanol. Four sprays at 10 day intervals were made. Mite population was recorded 3, 6 and 9 days after each spraying. Avermectin and mixture of azadirachtin with botanical extracts gave moderate to higher mite suppression (more than 64% suppression). Considering moderate to higher efficacy as well as its low toxicity to natural enemies and minimum impact on human health microbial toxin, botanical insecticides, botanical extracts can be incorporated in future Integrated Pest Management (IPM) and organic farming. Azadirachtin individually did not produce higher results but when mixed with botanical extracts gave higher results of mite control recording more than 64 % suppression. This treatment also is recommended for general farmers use.

***Keywords*—** Bio-pesticides, Microbial toxin, Plant extract, Organic cultivation, IPM

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Utilization of Concentrate Feed by Adding Different Levels of Azolla (Duckweed Fern) Mixed with Red Corn Meal and Rice Bran on Growth Performance of Local Muscovy Ducklings

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Abstract

The experiment was conducted at the Agricultural Station on the campus of Svay Rieng University, from May 25 to July 03, 2023. This experiment has three objectives: (1) Compare the feed intake of duck; (2) Compare the growth performance of duck; and (3) Compare feed conversion ratio of duck. Total of 120 ducks were selected and arranged into Complete Randomized Design (CRD) with 4 treatments and 3 replications. Experimental treatments were T1: Concentrate Feed 25% + Azolla 8% + Rice Bran 41% + Red Corn Meals 26%; T2: Concentrate Feed 25% + Azolla 6% + Rice Bran 45% + Red Corn Meals 24%; T3: Concentrate Feed 27% + Azolla 4% + Rice Bran 25% + Red Corn Meals 44%; and T4: Concentrate Feed 27% + Azolla 2% + Rice Bran 29% + Red Corn Meals 42%. The experiment period for 40 days, and all data were collected daily for feed offers and residues. The ducks were weighed every 10 days from the beginning to the end of experiment. The results showed that DM feed intake of T4 = 37 g/day was significant if compared to the T1 = 35.5 g/day, T2 = 34.9 g/day and T3 = 33.7 g/day ($P<0.05$). However, as comparing T1, T2 and T3 were non-significant ($P> 0.05$). The growth rate showed that T4 =7.61 g/day was higher significant on the live weight gain ($P <0.01$) as compared to the T2 = 6.19 g/day and T1=6.05g/day. However, if compare with T3 = 7.24 g/day was non-significant different ($P>0.05$). Feed conversion ratio showed that T4 = 4.87 or T3=4.66 was better significant as compared to the T1 = 5.87 and T2 = 5.85 ($P<0.01$). In conclusion, it found that the treatment 4, which used the concentrate feed 27% mixed with Azolla 2%, Rice Bran 29% and Red Corn Meal 42% was made the ducks getting the highest of DM feed intake and live weight gain, as well as a better feed conversion. On the other hand, these feeds are the type of feeds that farmers can easily find and can help reduce the cost of raising ducks.

Keywords— Concentrate Feed, Azolla, Red Corn, and rice bran.

Effect of Using Ensiled Cassava Leaves and Taro Mixed with Waste of Soybean Meal as Protein Sources for Growth Performance of Pigs Fed Basal Diets of Different Sources of Energy

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Abstract

The experiment was conducted at Svay Rieng University from April 15 to June 17, 2023. This experiment has 3 objectives: 1. Compare the feed intake of pigs, 2. Compare the growth performance of pigs, and 3. Compare the feed conversion ratio of pigs. 12 pigs were selected and designed in 2*2 factorial arrangement in Randomized Complete Block Design (RCBD) with 3 replications. The 1st factor: rice bran (RB) or broken rice (BR), and the 2nd factor: Ensiled taro plus waste of soybean meal (ETS) or Ensiled cassava leaf plus waste of soybean meal (ECS). The treatments were T1: Ensiled Taro 30% + Waste of Soybean Meal 20% + RB 49% + Premix 1%; T2: Ensiled Taro 30% + Waste of Soybean Meal 20% + BR 49% + Premix 1%; T3: Ensiled Cassava Leaf 25% + Waste of Soybean Meal 25% + RB 49% + Premix 1%; and T4: Ensiled Cassava Leaf 25% + Waste of Soybean Meal 25% + BR 49% + Premix 1%. The experiment period for 60 days, and all data such as feed offers and residues were collected daily. The pigs were weighed at every 10 days from the beginning of the experiment till the end of experiment. The resultes showed that DM intake on energy sources were higher significant in broken rice compared with rice bran ($P<0.01$) while DM intake on protein sources were higher significant for ETS ($P<0.01$). Growth rate on energy sources were higher significant in BR as compared to the RB ($P<0.01$) while growth rate for ETS was slightly high if compared with ECS ($P>0.05$). Feed conversion ratio on energy sources was better significant in BR compared to RB ($P<0.01$) as the feed conversion for ETS was slightly better as compared with ECS ($P>0.05$). In conclusion, when using the protein source of ETS plus energy source of BR or RB, it was increased on DM intake, growth rate and better improvement of feed conversion rather than using ECS plus BR or RB. The research outcome indicated efficiency of ETS mixed with basal diet of BR or RB on reproduction in the next trial.

Keywords— *Ensiled Taro, Cassava Leaf, Soybean, Rice Bran, Broken Rice.*

Representations and knowledge related to the environment and the covid-19 pandemic among secondary school students in Morocco

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Abstract

This study aimed to identify knowledge and representations linked to the environment and the Covid-19 pandemic, as well as its influence on the environment among secondary school students in Morocco. The method used was qualitative and descriptive research, through a survey applied to 433 first- and second-year baccalaureate students in three cities of different sizes, which was analyzed using the Excel spreadsheet and the IBM SPSS20 statistical software. The results showed that most students surveyed said their schools had environmental clubs. However, the majority of them say they are not members of these clubs, nor are they involved in any environmental activities inside or outside of school. In addition, they know neither the components of the environment nor the pollutants of these components. However, the majority of students interviewed demonstrated greater knowledge about the symptoms, transmission factors and multiplication of Covid-19. The environmental and health awareness of the students surveyed was heightened by the impact of the Covid-19 pandemic on the environment. The significant correlations detected between some of the variables studied made it possible to better explain the environmental knowledge of the students interviewed. Finally, this study will be followed by other studies to evaluate the dissemination and implementation of environmental education during the Covid-19 pandemic.

Keywords— Covid-19, Environment, Knowledge, Representations, Secondary School Students in Morocco

Nature's Challenge: Colonialism and the Altered Landscape ofCachar, Assam

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Abstract

The acquisition of the Cachar district in southern Assam by the British in 1832 marked the onset of colonial policies. Following the British acquisition of the Cachar, the region became an attractive investment opportunity for Europeans, particularly with the discovery of wild tea in 1855. The study examines three pivotal stages of nature's transformation in this context. Firstly, it explores the allocation and expansion of tea plantations, assessing their size and number. Secondly, it investigates the consequences of land grants, which led to the depletion of the natural forest. Finally, the study scrutinizes the heightened pressure on forests due to the demands imposed by immigrant laborers. Moreover, it emphasizes the role of the Forest Department in safeguarding these natural ecosystems against the activities of tea planters. Through a comprehensive analysis, this paper aims to unravel the intricate connections between colonialism and the altered landscape of Cachar, Assam, shedding light on the environmental, economic, and societal dimensions of this historical transformation.

Keywords— Cachar, Colonial policies, Forest Department, Tea plantation, Land grants

Effect of Para Grass and Mimosa Pigra Utilizations With Basal Diets of Brewr's Grain and Rice Bran on Growth Performance of Goat

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Abstract: In Cambodia, farmers are raising goats in a small scale, and they grow them in the traditional way under free ranging system during the day time and confinement at the night time. Due to the ease growing of para grass, natural growth of mimosa pigra and easily founded around the lakes, rivers, streams, and canals, these grasses are potential plants with high protein for raising goats. This experiment was carried out at Research Station of Svay Rieng University, located in Chambak village, Sangkat Chek, Svay Rieng town, Svay Rieng province. The three objectives of this study were to compare: (a) the feed intake of goats; (b) the growth performance of goats; and (c) the feed conversion ratio of goats. The treatments of the study are: T_1: Para grass 100%; T_2: Para grass 85% + Mimosa pigra 15%; T_3: Para grass 70% + Brewer grain 15%+ Rice bran 15%; T_4: para grass 55% + mimosa pigra 15%+ brewer grain 15%+ Rice bran 15%. As the research methodology, this experiment was carried out at Research Station of Svay Rieng University by using Randomized Complete Block Design (RCBD) with 4 treatments and 3 replications. All treatments utilized the different levels of para grass and mimosa pigra with basal diets of brewer's grain and rice bran on the growth performance of goats under a semi-free grazing system. The goats were weighed in the morning before feeding, at the beginning of the trial and every 10 days thereafter. The period of this experiment for sixty days of which from 01st April to 30th May 2022. Results showed that the highest DM intake of goats from 0–60 days is T4=684 g/day, the highest growth performance of goats from 0–60 days is T2=110 g/day, and the best feed conversion ratio of goats from 0–60 days is T2=5.89 if compared to other treatments. In conclusion, the utilization of 85% para grass combined with 15% mimosa pigra are actually increased the feed intake of goats, increased live weight gain of goats, and well improved feed conversion ratio of goats under the semi-free grazing system.

Keywords— Para Grass, Mimosa Pigra, Brewer Grain, Growth Performance

Effect of *Sesbania sesban* L. as a pre-rice crop and Nitrogen on Yield of Rainfed-lowland Rice

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Abstract

Rice (*Oryza sativa* L.) is the most important grain crop for more than half of the world's population especially in Asia. Nitrogen (N) plays a crucial role in rice production. The incorporation of the cover crop as a pre-rice crop is the potential to improve the nitrogen used by rice crops. The experiment was conducted on the clay loam of Svay Rieng Province Cambodia in 2022 during the rice cropping season. The trial was designed using Spit-Plot design, with 4 levels of nitrogen (N) as main-plot and Cover Crop (CC) as a sub-plot. The CC was either the absence of CC or the use of incorporated *Sesbania sesban* L. (30 kg ha^{-1}) as a pre-rice crop. The application rate of nitrogen was 0, 35, 70 and 105 kg ha^{-1}, respectively. Direct-seeded rice was 100 Kg ha^{-1}. The size of each plot was 16 m^2 (4 m×4 m). The experiment was conducted in 3 replicates. The result showed that An analysis of variance in plant height revealed a significant difference at 1% ($P < 0.01$) effect of nitrogen levels. N35 was the tallest average plant height (82.95 cm) and N0 was the shortest average plant height (77.15 cm) and there was a significant difference at 5% ($P> 0.05$) in CC cultivation. CC1 was the tallest plant height (81.75 cm) while CC0 was the shortest plant height (78.49 cm). However, the interaction between N and CC was not statistically significant at 5% ($P > 0.05$). An analysis of variance on Grain yield showed a significant difference at 1% ($P < 0.01$) N70 was the highest average yield (4.92 tons/ha) and N0 was the lowest yield average (3.53 tons/ha) and there was a significant difference at 1% ($P < 0.01$). CC1 had the highest average yield (4.60 tons/ha), while CC0 had the lowest average yield (4.13 tons/ha). the interaction between N and CC was not statistically significant ($P > 0.05$). The results suggested that among 4 levels of nitrogen, The application of any rate of fertilizers increased the grain yield compared to non-N application. The grain yield was even higher with the incorporation of CC as a pre-rice crop.

Keywords— Nitrogen, Rice and Sesbania sesban

Effects of calcium on the growth of melon (Cucumis melon L.)

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Abstract

Melon (*Cucumis melon* L.) is an important crop for the world economy, and it is one of the most valuable crops in the market. The cultivation of melon in Cambodia is still low due to the unclear use of varieties and the inappropriate cultivation techniques that cannot achieve high yields. This is the reason why this research is conducted. The objectives of this research are: 1. to compare the growth of melon varieties with calcium in Svay Rieng province condition, 2. to study the appropriate level of calcium fertilizer on melon yield in the supplementary stage, and 3. to study the fruit quality of the five melon varieties. This experiment was arranged into Randomized Complete Block Design (RCBD) with 4 replications and 20 treatments equivalent to 80 plots totally at the Agricultural Station of Svay Rieng University. The results showed that the application of calcium fertilizer and foliar spraying once every 7 days resulted in the highest growth of melon plants. The use of different varieties showed that the melon varieties V4 (Lady Green = 547) and V2 (Lady Gold = 518) received the highest number of seeds. Thus, in summary, comparing the growth of 5 melon cultivars with 4 levels of calcium fertilizer, the results showed that the application of calcium fertilizer and leaf spray every 4 days, every 7 days, made the melon crop. Growth, yield, and fruit quality are excellent. The use of different varieties showed that only the melon varieties V4, V1, and V2 are the best.

Keywords— Melon, stem height, number of leaves, fruit size, flesh thickness, sugar level, fruit weight, melon yield

Participatory Rural Appraisal to Characterize Smallholder Cattle Production System's

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Abstract

Cattle farming is an integral component of farmers' livelihoods that supports farmers' life, and provides food security, household job creation and income generation. The objectives of the recent research were to characterize cattle production systems with emphasis on breeding, feeding and diseases prevalence, to identify problems that affect community cattle production system and to set priorities for research and development that can contribute to improved systems of cattle production. Information and data collection were conducted by using Participatory Rural Appraisal (PRA) tools based on the objectives of the research including historical profile of cattle production, village mapping, farm sketch, transect walk, seasonal calendar, livelihood mapping, Venn diagram, matrix scoring, pairwise ranking, problem tree analysis, SWOT analysis and problem and opportunity analysis. The finding revealed that cattle production of smallholders was in low productivity due to no handling management on breeding as the farmers grazing freely their animals allowing them mated at the grazing land of rice field. This may lead to inbreeding. From 2008, some farmers started to bring exotic breed to raise in their region which has large body size, strong power and high selling price and the farmers also started to grow grass forage in small area for their cattle. The problems and constraints that affected the cattle production included infectious diseases such as Foot-and-Mouth disease, Hemorrhagic Septicemia, blackleg and roundworms and other factors such as drought, technical shortage, grazing land shortage, feed shortage and drastically selling price dropdown since 2022. Livestock raising was the second source of income as the farmers kept animals in small scale and free range. In cattle raising system, the available feeds used by farmers included rice straw, grass at the rice field, cut and curry grass, cassava foliage, banana stem, rice bran, sugar can top, palm fruit and Brewer's spent grain as well as some cultivated forage grass. In order to solve the mentioned problem, the farmers have to vaccinate their animals, follow technical standard of cattle raising, animal forage establishment, process available agricultural residues and by-products for their animals, access animal market flow and collaborate with Animal Production and Health Office.

Keywords: Cattle production; Participatory Rural Appraisal; cattle feed, cattle disease

The Effect of Ethylene Absorbents in Packaging on Shelf Life of Bananas

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Abstract

Bananas are famous for consumption all over the world because of their nutritive value and easy to eat. Therefore, convenient stores sell ready-to-eat bananas, both as single and a bunch. However, due to their short shelf life, this experiment aimed to study the effects of ethylene absorbents to extend shelf life of bananas while selling. To clarify, the bananas cleaned with water and incubated were used with ethylene absorbents. Then, they were stored to simulate selling conditions under 25^{O}C for 6 days. The experiment was divided into 2 sub-experiments, i.e., Sub-experiment 1: Single banana storage (1 banana/1 bag), and Sub-experiment 2: Banana bunch storage (3 bananas/1 bag). Each sub-experiment included 4 processes, i.e., Process 1: no ethylene absorbent (control), Process 2: added commercial ethylene absorbent, Process 3: added 1 packet of corncob biochar ethylene absorbent, and Process 4: added 2 packets of corncob biochar ethylene absorbent. It was found that ethylene absorbents from the three processes could reduce the rate of ethylene accumulated in the bags of single and bunches of bananas better than the control process. For the quality of bananas, it was found that 1 banana in 1 bag and 1 bags of banana bunches packed with 1 packet of corncob biochar ethylene absorbent generated the fruit firmness of banana pulp, yellow of peels (*b value), highest consumer acceptance, and can last on shelf up to 6 days. In contrast, bananas in the control process could last on shelf for only 4 days. When calculating the cost of using the absorbents, it was found that corncob biochar ethylene absorbent costed 0.1 baht/packet whereas commercial ethylene absorbent costed 2 baht/packet. Therefore, the researcher suggested 1 packet of biochar ethylene absorbent for single bananas, and banana bunches while selling so that consumers will get good-quality bananas.

Keywords— corncob biochar, quality, ethylene absorbents, packaging, banana

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Growth and Yield Responses of Green Mustard (*Brassica juncea* L.) by Using Cow Manure and Nitrogen Levels in Dry Season

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Abstract

This experiment was done with 2 factors such as 3 varieties of the green mustard and cow manure with 3 levels of nitrogen fertilizer. The variety factor, *Brassica juncea*, there were 3 varieties of the green mustard, namely (V1) *pretty mustard*, (V2) *black mustard* (*coss*) and (V3) *green - leaf mustard*. The fertilizer factor, the use of cow manure fertilizer was 20 t/ha with 3 levels of nitrogen fertilizer, namely (F1) nitrogen fertilizer of 0 Kg/ha, (F2) nitrogen fertilizer of 15 Kg/ha and (F3) nitrogen fertilizer of 30 Kg/ha. By using Randomized Complete Block Design (RCBD) with 4 replications and 9 treatment combinations which were equal to 36 small plots.

The results showed that plant height of green mustard at 28 DAT measurement was the highest plant height of V1 = 21.08 cm and cow manure and nitrogen levels of F3 = 22.67 cm. Leaf length of green mustard at 28 DAT measurement was the highest leaf length of V1 = 16.02 cm and cow manure and nitrogen levels of F3 = 17.73 cm. Leaf number of green mustard at 28 DAT measurement was the highest leaf number of V3 = 17.80 leaf/stem and cow manure and nitrogen levels of F3 = 15.43 leaf/stem. Yield of green mustard at the harvesting, the highest yield was the factorial treatment combination [V3 = *green-leaf mustard* and cow manure and nitrogen levels (cow manure = 20 t/ha + nitrogen = 30 kg/ha)] of V3F3 = 8.92 t/ha.

The results could be concluded that plant height of green mustard at 28 DAT measurement, the highest was cow manure and nitrogen levels (cow manure = 20 t/ha + nitrogen = 30 kg/ha) of F3 = 22.67 cm. Leaf length of green mustard at 28 DAT measurement, the highest was cow manure and nitrogen levels (cow manure = 20 t/ha + nitrogen = 30 kg/ha) of F3 = 17.73 cm. Leaf number of green mustard at 28 DAT measurement, the highest was cow manure and nitrogen levels (cow manure = 20 t/ha + nitrogen = 30 kg/ha) of F3 = 15.43 leaf/stem. Yield of green mustard at the harvesting, the highest was the factorial treatment combination of V3F3 = 8.92 t/ha.

Keywords— green mustard, seed, cow manure, nitrogen, yield

Effect of Using King Grass and Water Hyacinth feed Ensiled Banana Stem with Rice Bran or with Yeast on Growth Performance of Local Goats

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Abstract

The research experiment was conducted at the Agricultural Station on the campus of Svay Rieng University and was carried out from April 11 to June 19, 2023 with the title "Effect of Using King Grass and Water Hyacinth feed Ensiled Banana Stem with Rice Bran or with Yeast on Growth Performance of Local Goats". A total of 12 goats were selected and designed in 2*2 factorial arrangements in Randomized Complete Block Design (RCBD) with 3 replications. The factors of the energy source: ensiled banana stem with rice bran (EBR) or ensiled banana stem with yeast (EBY), and the factor of the protein source: King Grass (KG) or Water Hyacinth (WH). There were 3 objectives: 1) Compare the feed intake of goats, 2) Compare the growth performance of goats, and 3) Compare the feed conversion ratio of goats. The treatments of the study were: T1: KG 65% + EBY 35%; T2: KG 65% + EBR 35%; T3: WH 65% + EBY 35%; and T4: WH 65% + EBR 35%. The experiment period for 60 days, and all data were collected daily for feed offer and feed residues. The goats were weighed at every 10 days from the beginning of the experiment to the end of experiment. The findings of the experiment showed that DM intake on the energy sources were non-significant differently for the EBR compared with the EBY ($P>0.05$) while DM intake on the protein sources were higher significant for KG as compared with WH ($P<0.01$). Growth rate and feed conversion on the energy sources were slightly high for the EBY rather than the EBR ($P>0.05$), and were slightly high for KG than water hyacinth ($P>0.05$). In conclusion, when using the protein source of KG mixed with the energy source of the EBR or EBY, it was increased on DM intake, growth rate and better improvement of feed conversion of goats rather than using WH mixed with EBR or EBY. The efficiency of protein utilization from then study is well performance on using the KG rather than WH once mixed with either the EBR or EBY.

Keywords— King Grass, Water Hyacinth, Banana Stem, Rice Bran and Yeast